MATH132 : History of Mathematics Outside of Europe

General Information

Author:	• Suzanne Palermo • Djrbashian, Ashot
Course Code (CB01) :	MATH132
Course Title (CB02) :	History of Mathematics Outside of Europe
Department:	MATH
Proposal Start:	Fall 2024
TOP Code (CB03) :	(1701.00) Mathematics, General
CIP Code:	(27.0101) Mathematics, General.
SAM Code (CB09) :	Non-Occupational
Distance Education Approved:	No
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000644456
Curriculum Committee Approval Date:	12/13/2023
Board of Trustees Approval Date:	04/16/2024
Last Cyclical Review Date:	12/13/2023
Course Description and Course Note:	MATH 132 is devoted to the study of Mathematics developed outside of European civilization. Students explore topics from the ancient civilizations of Egypt, Mesopotamia, India, China, Arabic World, Native American countries. These topics include number systems, methods of geometric measurements, astronomical calculations, and solving equations throughout the centuries. Emphasis is on the analysis of these mathematical concepts and their applications of quantitative reasoning.
Justification:	New Course
Academic Career:	• Credit
Author:	• Suzanne Palermo

Academic Senate Discipline

Primary Discipline:	• Mathematics

Course Development

Basic Skill Status (CB08)

Course is not a basic skills course.

☐ Allow Students to Gain Credit by Exam/Challenge

Course Special Class Status (CB13)

Course is not a special class.

Pre-Collegiate Level (CB21)

Not applicable.

Grading Basis

- Grade with Pass / No-Pass Option

Course Support Course Status (CB26)

Course is not a support course

Transferability & Gen. Ed. Options

General Education Status (CB25)

GE Status (CSU) B4, (UC) 2

Transferability

Transferable to both UC and CSU

Transferability Status

Approved

CSU GE-Breadth Area	Area	Status	Approval Date	Comparable Course
B4-Mathematics/Quantitative Reasoning	Mathematics/Quantitative Reasoning	Pending	No value	No Comparable Course defined.

IGETC Area	Area	Status	Approval Date	Comparable Course
2-Math	Mathematical Concepts and Quantitative Reasoning	Pending	No value	MAT 111 - UCD

Units and Hours

Summary

Minimum Credit Units (CB07)	3
Maximum Credit Units (CB06)	3
Total Course In-Class (Contact) Hours	54
Total Course Out-of-Class Hours	108
Total Student Learning Hours	162

Credit / Non-Credit Options

Course Type (CB04)

Credit - Degree Applicable

Noncredit Course Category (CB22)

Credit Course.

Noncredit Special Characteristics

No Value

Course Classification Code (CB11)

Credit Course.

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

Variable Credit Course

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	3	6
Laboratory Hours	0	0
Studio Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	54
Course In-Class (Contact) Hours	
Lecture	54
Laboratory	0
Studio	0
Total	54
Course Out-of-Class Hours	
Lecture	108
Laboratory	0
Studio	0
Total	108

Time Commitment Notes for Students

No value

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Pre-requisites, Co-requisites, Anti-requisites and Advisories

Prerequisite

MATH90 - Intermediate Algebra for BSTEM

Objectives

- Solve linear equations and compound inequalities.
- Solve a system of linear equations using elimination substitution.
- Solve quadratic equations with real and complex solutions.

OR

Prerequisite

Placement is based on academic background or successful completion of MATH 90.

Entry Standards

Entry Standards

Course Limitations

Cross Listed or Equivalent Course

No value

Specifications

Methods of Instruction

Methods of Instruction	Lecture
Methods of Instruction	Presentations
Methods of Instruction	Discussion
Methods of Instruction	Collaborative Learning

Out of Class Assignments

- Homework assignments (e.g. problem sets related to course content)
- Group or individual projects (e.g. solving more challenging problems from other sources and further applications)
- Reading assignments (e.g. reading literature related to the history of the course subject)

Methods of Evaluation	Rationale
Exam/Quiz/Test	Quizzes
Exam/Quiz/Test	Two to three regularly scheduled exams
Exam/Quiz/Test	One comprehensive final examination

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
No Value	No Value	No Value	No Value	No Value

Other Instructional Materials (i.e. OER, handouts)

Description	History of Mathematics Outside of Europe
Author	Djrbashian, Ashot
Citation	2023
Online Resource(s)	No value

Materials Fee

No value

Learning Outcomes and Objectives

Course Objectives

Evaluate numeric expressions using different numeric systems such as binary, decimal, sexagesimal, and others.

Apply methods of performing arithmetic operations in ancient cultures.

Recognize the origins of different mathematical discoveries.

Perform certain algebraic operations using non-traditional ancient methods.

SLOs

Perform arithmetic and algebraic operations with different numeric systems.	Expected Outcome Performance: 70.0
Distinguish between mathematical discoveries done in different civilizations.	Expected Outcome Performance: 70.0

Additional SLO Information

Does this proposal include revisions that might improve student attainment of course learning outcomes?

No

Is this proposal submitted in response to learning outcomes assessment data?

No

If yes was selected in either of the above questions for learning outcomes, explain and attach evidence of discussions about learning outcomes.

No Value

SLO Evidence

No Value

Course Content

Lecture Content

Numerals and Counting Systems (12 hours)

- Language and Numerals: how language affects mathematical thinking
- Symbols for Numerals, from pictures to alphabets
- Fractions and Arithmetic Operations, differences between ancient and modern methods
- Hindu-Arabic numeration systems and place value systems
- Indigenous American numeration systems

Geometry and Astronomy (15 hours)

- Egypt and Mesopotamia: measuring distances and land area
- India and Islamic World: equi-measure objects of different shapes
- China and Far East: what was common and what was uniquely different in East Asia compared to other parts of the World
- Pre-Columbian America, stars and calendars

Algebra and Solutions of Equations (15 hours)

- Mathematical Notations and their importance in progress of sciences and mathematics
- Arabic World: solutions of higher order equations
- India, China, Japan: matrices and linear methods

Trigonometry and Beyond (12 hours)

- Basic Trigonometry: from Hellenistic Egypt, Mesopotamia and Islamic countries
- Indian mathematicians of Kerala region: Calculus and transcendental functions
- Twentieth century mathematics outside of Europe

Total hours: 54